REMARKS

Claims 1 and 6 have been amended to more clearly define the subject matter which Applicants regard as the invention. Specifically, Claims 1 and 6 have been amended to recite nanocrystals constituting a quantum dot. Support for amended Claims 1 and 6 can be found at, for example, paragraphs [0024] and [0027]. Entry of this Amendment is respectfully requested. Claim 1-13 are pending.

Applicants also note that the Office Action of May 7, 2009 was non-final, as indicated in the body of the Office Action at Paragraph No. 2 and also by the lack of other indication in the body of the Office Action that the Action was final. Accordingly, the notation on the Summary sheet that the Office Action was final is understood to be in error.

Response to Claim Rejections Under 35 U.S.C. § 102

Claims 1, 4, and 8-9 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent Application Publication No. 2002/0151094 to Andriessen.

Applicants respectfully traverse.

The present claims recite a quantum dot-dispersed light emitting device comprising: a substrate; an electron injection electrode; a hole injection electrode; and an inorganic light emitting layer disposed so as to be in contact with both the electrodes. The inorganic light emitting layer includes an ambipolar inorganic semiconductor material and nanocrystals constituting a quantum dot dispersed as luminescent centers in the ambipolar inorganic semiconductor material, and is configured without having, at the interface with the electron injection electrode and/or the hole injection electrode, epitaxial relation therewith.

As shown in the attached excerpt from *Semiconductor Nanocrystals*, it is well known in the art that "quantum dot" means a dot having a Quantum Confinement Effect. In this regard,

Applicants submit that the nanocrystal of the present invention is different from the nanoparticle of the cited art. Specifically, the nanocrystal of the present invention is not a quantum dot, *per se*.

According to the present invention, in the case where the nanocrystal is included in a matrix, 3D quantum well, a quantum dot is formed by forming a well portion of the quantum dot with the nanocrystals and forming a barrier portion of the quantum dot with the matrix.

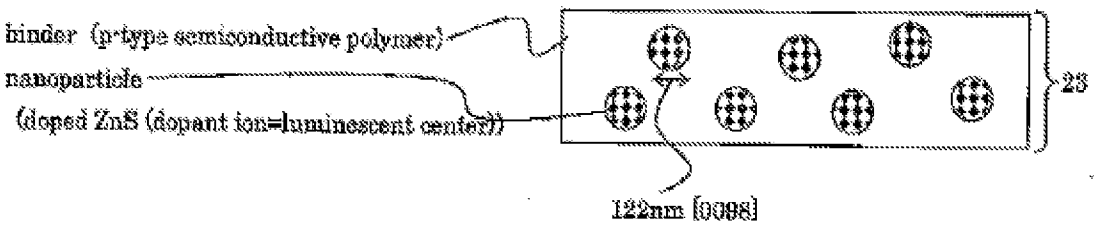
Alternatively, in the case where the nanocrystal has a core/shell structure, the nanocrystal has a core constituting the well portion of the quantum dot and a shell constituting the barrier portion of the quantum dot, and such nanocrystals do function independently as a quantum dot (e.g., the nanocrystal having the core/shell structure is dispersed in another semiconductor material and forms a light emitting active layer).

In the above instances, according to the present invention, the nanocrystal is a semiconductor crystal constituting a quantum dot, and has a Quantum Confinement Effect so that it provides a light emitting active electrically-conductive property which is different from the semiconductor material as a whole. Thus, the nanocrystals of the present invention differ from the mere nanoparticles of Andriessen with respect to their properties.

In addition, the Examiner asserts at pages 2 and 3 of the Office Action that Figs. 1A-1E of Andriessen disclose a quantum dot-dispersed light emitting device comprising an inorganic light emitting layer which includes an ambipolar inorganic semiconductor material. Applicants disagree and request that the Examiner specifically indicate where the "quantum dot" is shown in Figs. 1A to 1E of Andriessen.

The Examiner also asserts that member 23 of Fig. 1(a) of Andriessen corresponds the light emitting layer of the present invention, and further that member 23 includes ambipolar inorganic semiconductor material and nanocrystals. Applicants respectfully disagree.

For the Examiner's ease of reference, Applicants submit below a graphical representation of the light emitting layer 23 (Doped ZnS + binder) of Andriessen:



Though member 23 may function as a light emitting layer, the portion of the present invention corresponding to the above-described binder is ambipolar and inorganic. In contrast, Andriessen discloses at paragraph [0049] that the binder comprises a water-compatible p-type semiconductive polymer. That is, the binder of Andriessen is p-type and organic. Therefore, the binder of Andriessen differs from the portion of the present invention corresponding to the binder.

In addition, the dopant ion in the nanoparticle of Andriessen functions as a luminescent center. Thus, since the quantum dot has a Quantum Confinement Effect as discussed above, it would be apparent to one skilled in the art that the dopant ion and doped ZnS including the dopant ion of Andriessen is not a quantum dot. Further, it would be apparent to one skilled in the art that the nanoparticle of Andriessen does not have a quantum dot function (i.e., a Quantum Confinement Effect) based on the size of the nanoparticle being 122nm.

Regarding the ZnS being employed as an example of the above-described binder, Applicants note that the ZnS of the present invention is not used with the nanoparticle as it is in Andriessen. In this regard, the Examiner refers to paragraph [0066] of Andriessen as evidence that the light emitting layer of Andriessen is an ambipolar inorganic semiconductor material. In so doing, the Examiner takes the position that the ZnS of the nanoparticle material of Andriessen is a quantum dot, as presently claimed, while also taking the position that the ZnS is an ambipolar semiconductor material (i.e., a binder). Applicants note that if the ZnS is the binder, then the luminescent center of Andriessen is a dopant ion, and Andriessen does not disclose or suggest that the luminescent center is a nanoparticle.

Thus, Andriessen fails to anticipate the present claims. Accordingly, withdrawal of the rejection is respectfully requested.

Response to Claim Rejections under 35 U.S.C. § 103

(A) Claims 2-3 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Andriessen in view of Danek et al. ("Electrospray Organometallic Vapor Deposition- A Novel Technique for Preparation of Quantum Dot Composites"). Applicants respectfully traverse.

(B) Claims 5 and 7 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Andriessen in view of U.S. Patent No. 5,422,902 to Mensz. Applicants respectfully traverse.

(C) Claim 6 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Andriessen in view of U.S. Patent Application Publication No. 2004/0023010 to Bulovic et al. Applicants respectfully traverse.

(D) Claim 10 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Andriessen in view of U.S. Patent Application Publication No. 2002/0167280 to Hayashi.

Hayashi fails to remedy the deficiencies of Andriessen. Withdrawal of the rejection is respectfully requested.

(E) Claim 11 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Andriessen in view of U.S. Patent Application Publication No. 2003/0094897 to Koyama et al.

Koyama et al. fails to remedy the deficiencies of Andriessen. Withdrawal of the rejection is respectfully requested.

(F) Claims 12 and 13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Andriessen.

Applicants respectfully traverse, for the reasons set forth above in response to the § 102 rejection based on Andriessen.

Danek, Mensz, Bulovic, Hayashi and Koyama fail to remedy the deficiencies of Andriessen. Thus, Claims 2, 3, 5-7 and 10-13 are patentable at least by virtue of their dependence from Claim 1. Accordingly, withdrawal of the rejections is respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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